

Appln. No. 10/788,621

Attorney Docket No. DKT03160

II. Remarks

Claims 1, 3, 6 through 8, 13 through 15, 18, 21, 22 and 24 through 26 are pending in the application. Claims 2, 4, 5, 9 through 12, 16, 17, 19, 20 and 23 have previously been cancelled. Claims 1, 8 and 15 have been amended. Claims 27, 28 and 29 have been added.

Rejections Under 35 USC § 103

At the outset, the undersigned wishes to thank the Examiner for the thoughtful and complete response to the arguments appearing in Applicants' previous Reply. Such information is of significant assistance during the subsequent prosecution of this patent application.

Claims 1, 3, 6 through 8, 13, 14, 24 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,595,338 issued to Bansbach et al. in view of U.S. Patent No. 5,611,407 issued to Maehara et al. and U.S. Publication No. 2002/0162328 A1 of Shaw et al.

Bansbach et al. teaches a friction clutch for use in a transfer case having a closed hydraulic circuit pressurized by the electric motor and lead screw and operating on an annular piston or plurality of smaller pistons. The Bansbach et al. device also includes a return spring 130 which urges the apply plate 76 into its released position and ensures that no drive torque is transferred through the clutch pack. Bansbach et al., however, is silent with regard to whether back driving, that is, release of hydraulic pressure, clutch engagement and torque transfer when power is no longer applied to the motor is desirable, problematic or whether it occurs.

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The Examiner has combined Bansbach et al. with Maehara et al. inasmuch as it utilizes an anti-back drive wrap spring assembly in a hydraulic drive unit. However, the reference lacks any hydraulically activated device such as a slave piston and associated friction clutch. Given their conflicting disclosures, it is not at all clear that the combination renders the present claims obvious. Bansbach et al. suggests that facilitating relaxation of the clutch is desirable when power is no longer applied to the motor as it includes the return spring 130 and does not discuss maintenance of clutch position and hydraulic pressure when power is removed from the motor. Conversely, Maehara et al. address the issue of power off back driving of the motor and include a device which prevents it. Nonetheless, from these conflicting configurations, the Examiner asserts that the modification of Bansbach et al. by incorporation of an anti-back drive device such as that disclosed by Maehara et al. is obvious. In fact, what is apparent is that the rejection is a hindsight reconstruction of Applicants' claimed invention, guided and achieved by use of Applicants' own disclosure. Patentability resides in the subject claims.

Nonetheless, and in an effort to confer, without debate, patentability upon the subject claims, Applicants have further amended independent claims 1, and 8 to additionally recite that the device includes means for inhibiting rotation of the annular or slave piston associated with the friction clutch pack. Notwithstanding the thrust bearing disposed between the face of the annular or slave piston and the apply plate which rotates with the clutch elements, rotational force can be exerted upon the annular piston. Resulting rotation of the annular piston is undesirable in that it subjects the surfaces of the O-rings on the annular or slave piston to additional motion and causes unnecessary wear. Thus, inhibiting rotary motion of the piston

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and limiting its motion to axial motion improves the service life of the associated O-rings. A search of the references of record during the prosecution of this patent application reveals no such piston configuration. Accordingly, in view of the subject claim amendments and foregoing arguments, it is submitted that independent claims 1, 8 and as well as claims 3, 6, 7, 13, 14, 24 and 25 are patentable.

Claims 15, 18, 21, 22 and 26 were rejected under 35 U.S.C. 103(a) as being unpatentable over Bansbach et al. in view of Maehara et al. and Shaw et al. as applied to claims 1, 3, 6 through 8 13, 14, 24 and 25 above, and further in view of U.S. Patent No. 6,047,546 issued to Takeyama.

The Bansbach et al. and Maehara et al. references as well as the difficulty of combining them under a proper application of 35 U.S.C. 103(a) has been set forth above and is incorporated herein by reference. This combination is further modified by Shaw et al. which is relied upon for its disclosure of a pressure transducer. The Examiner asserts that it is an obvious modification to provide a pressure sensor for the purpose of protecting the system from overpressure. This argument appears wide of the mark inasmuch as neither Shaw et al. nor Applicants address the fact of or problems associated with system overpressure. Shaw et al., however, does appear to utilize the information received from the pressure sensor 174 in a control device 176. In addition to the conflicting disclosures of Bansbach et al. and Maehara et al., Shaw et al. teach a hydraulic circuit distinct from that utilized by Applicants and its suggestion to combine and modify is not entirely consistent with Applicants' device. Shaw et al. utilize a control valve 170 between the hydraulic pressure generator and the control device. Thus, the sensor 174 may not sense pressure generated by the actuator but only that associated with the hydraulic cylinder.

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Moreover, if the valve 170 were closed, any pressure experienced by the hydraulic actuator or the shuttle valve 180, would not be sensed by the sensor. No such shut off or insulating feature is present in Applicants' device. In sum, the Shaw et al. disclosure includes features which render its combination with the Bansbach et al. and Maehara et al. teaching inconsistent with an obviousness rejection under 35 U.S.C. §103(a).

Nonetheless, claim 15 has been amended in a manner similar to that undertaken with regard to independent claims 1 and 8. That is, a limitation regarding a means to inhibit rotation of the annular piston has been incorporated into the claim. Such limitation is nowhere found in the references of record in this patent application and it is submitted that such amendment confers patentability on independent claim 15 as well as claims 18, 21, 22 and 26. Allowance is respectfully requested.

Finally, new claims 27, 28 and 29 have been added which further limit the newly incorporated recitation of independent claims 1, 8 and 15. Their allowance is also requested.

SUMMARY

Entry of this Amendment under the provisions of 37 C.F.R. 1.116 is earnestly requested in order to confer patentability upon the claims and either conclude prosecution of this patent application or place it in better form for consideration on appeal.

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Pending Claims 1, 3, 6 through 8, 13 through 15, 18, 21, 22 and 24 through 26 as amended are patentable. Applicants respectfully request the Examiner grant allowance of these claims. The Examiner is invited to contact the undersigned attorneys for the Applicants via telephone if such communication would expedite this application.

Respectfully submitted,

Sep 13, 2006
Date

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